

### **Amendments to the Claims**

This listing of claims will replace all prior versions and listings of claims in the application:

#### **Listing of Claims:**

Claims 1 – 8 (cancelled)

9. (currently amended) An apparatus which may be used for stirring and injecting a gas into a liquid located in a container, wherein said apparatus comprises:

- a) a reactor, wherein said reactor contains a liquid;
- b) a drive device located above said reactor, wherein:
  - 1) said drive device comprises a vertical output shaft;
  - 2) said output shaft comprises at least one axial-flow moving assembly; and
  - 3) said axial-flow moving assembly is:
    - i) located at a lower end of said output shaft; and
    - ii) substantially submerged in said fluid;
- c) a cylinder located around said output shaft, wherein:
  - 1) said cylinder comprises both an upper and a lower cylinder end; and
  - 2) said upper cylinder end:
    - i) is substantially sealed to said drive device; and
    - ii) comprises an opening for injecting a gas into an annular gap between said output shaft and said cylinder;
- d) a self-priming impeller, wherein:
  - 1) said impeller is submerged in said liquid and is capable of being driven by said output shaft; and
  - 2) said impeller comprises:

- i) a substantially planar upper disk, wherein:
  - aa) said upper disk is perforated with a central hole;
  - bb) the edge of said central hole and said lower cylinder end form an at least partially annular space; and
  - cc) said liquid is sucked into said impeller through said annular space;
- ii) a lower disk, wherein the surface area of said lower disk is less than the surface area of said upper disk; and
- iii) a set of radial vanes located between, and attached to, said upper and said lower disks; and
- e) a direction means for directing a gas/liquid dispersion expelled radially from said impeller toward said axial-flow moving assembly, wherein said lower disk is at least partially cut out.

10. (previously presented) The apparatus of claim 9, wherein the diameter of said lower disk is less than the diameter of said upper disk.

11. (previously presented) The apparatus of claim 10, wherein said diameter of said lower disk is greater than or equal to the diameter of said partially annular space.

12. (canceled)

13. (previously presented) An apparatus which may be used for stirring and injecting a gas into a liquid located in a container, wherein said apparatus comprises:

- a) a reactor, wherein said reactor contains a liquid;
- b) a drive device located above said reactor, wherein:
  - 1) said drive device comprises a vertical output shaft;

- 2) said output shaft comprises at least one axial-flow moving assembly; and
- 3) said axial-flow moving assembly is:
  - i) located at a lower end of said output shaft; and
  - ii) substantially submerged in said fluid;
- c) a cylinder located around said output shaft, wherein:
  - 1) said cylinder comprises both an upper and a lower cylinder end; and
  - 2) said upper cylinder end:
    - i) is substantially sealed to said drive device; and
    - ii) comprises an opening for injecting a gas into an annular gap between said output shaft and said cylinder;
- d) a self-priming impeller, wherein:
  - 1) said impeller is submerged in said liquid and is capable of being driven by said output shaft; and
  - 2) said impeller comprises:
    - i) a substantially planar upper disk, wherein:
      - aa) said upper disk is perforated with a central hole;
      - bb) the edge of said central hole and said lower cylinder end form an at least partially annular space; and
      - cc) said liquid is sucked into said impeller through said annular space;
    - ii) a lower disk, wherein the surface area of said lower disk is less than the surface area of said upper disk; and
    - iii) a set of radial vanes located between, and attached to, said upper and said lower disks; and
- e) a direction means for directing a gas/liquid dispersion expelled radially

from said impeller toward said axial-flow moving assembly, wherein said lower disk is at least partially cut out and said cut out is in the form of an annulus.

14. (previously presented) The apparatus of claim 9, wherein said axial-flow moving assembly comprises a propeller.

15. (previously presented) The apparatus of claim 9, wherein:

- a) said directing means comprise a baffle-forming annular casing located around said impeller;
- b) said annular casing directs a stream of said dispersion, radially from said impeller, towards said axial-flow moving assembly; and
- c) said annular casing is perforated with at least two central openings, wherein said openings are coaxial with said output shaft.

16. (previously presented) The apparatus of claim 9, wherein said axial-flow moving assembly is the final assembly located on said output shaft.